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UTILITY PATENT APPLICATION TRANSMITTAL
(For new Non-provisional applications under 37 CFR1.53(b))

Attorney Docket No.: BAL6019P0021US
First Named Inventor: Scott Trees et al.
Express Mail Label No. EL515100162US

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09/488296
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Box PATENT APPLICATION
Assistant Commissioner For Patents
Washington, D.C. 20231

Sir:

Transmitted herewith for filing is a new utility patent application of inventor(s): **Scott Trees and Andreas Olbring** and entitled: **Altered Flower Pattern and Color in New Guinea Impatiens.**

Application Elements:

1. ☒ Specification containing 27 pages (preferred arrangement set forth below)
 - Descriptive Title of the Invention
 - Cross-reference to related applications (if applicable)
 - Statement regarding Federally-sponsored Research & Development (if applicable)
 - Reference to Microfiche Appendix (if applicable);
 - Background of the Invention
 - Brief Summary of the Invention
 - Brief Description of the Drawings (if filed)
 - Detailed Description
 - Claim(s)
 - Abstract of the Disclosure
2. ☒ Drawings: 5 Sheets of ☒ formal drawings ☐ informal drawings
3. ☒ Oath or Declaration
 - a. ☐ An executed declaration or oath for the utility patent application including a power of attorney,
 - b. ☒ An unexecuted declaration or oath for the utility patent application including a power of attorney;
 - c. ☐ Copy from a prior application (37 CFR 1.63(d), for continuation/divisional with No. 16 completed. [Note No. 4 below.]).
 - i. ☐ Signed statement attached deleting inventor(s) named in the prior application (see 37 CFR 1.63(d)(2) and 1.33(b).
4. ☐ **For CONTINUATION or DIVISIONAL Applications only:** The entire disclosure of the prior application, from which an oath or declaration is supplied under Box 3c, is considered as being part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.

5. ☐ Microfiche Computer Program (Appendix)
6. ☐ Nucleotide and/or Amino Acid Sequence submission. including:
☐ Computer readable copy,
☐ Paper copy (identical to computer copy),
☐ Statement verifying identity of above copies.

Accompanying Application Parts:

7. ☐ Assignment Papers (cover sheet, document(s) and requisite fee).
8. ☐ 37 CFR 3.73(b) Statement (where there is an assignee)
☐ Power of Attorney
9. ☐ English Translation document (if applicable)
10. ☐ Information Disclosure Statement (IDS), including PTO-1449
☐ Copies of IDS Citations
11. ☐ Preliminary Amendment
12. ☒ Return Postcard for PTO Mail Room Date Stamp (should be specifically itemized).
13. ☐ Small Entity Statement(s)
☐ Statement filed in prior application, status still proper and desired.
14. ☐ Certified Copy of Priority Document(s) (if foreign priority is claimed).
15. ☐ Other _____
16. ☐ **If Continuing Application**, check appropriate box and supply the requisite information below and in a preliminary amendment:
☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No. _____, filed _____.
Prior application information: Examiner: _____ Group/Art Unit: _____

Fee Calculation


The filing fee has been calculated as shown below:

Small Entity						Large Entity	
For	No. Filed	No. Allowed	No. Extra	Rate	Fee	Rate	Fee
Basic Fee					\$345.00		\$690.00
Total Claims	40	- 20 =	20	x \$9.00	\$	x \$18.00	\$360.00
Indep. Claims	5	- 3 =	2	x \$39.00	\$	x \$78.00	\$156.00
Multiple Dependent Claims Present				+ \$130.00	\$	+ \$260.00	\$
				TOTAL	\$	TOTAL	\$1206.00

17. ☒ A check in the amount of \$1206.00 to cover the filing fee is enclosed.
18. ☐ Please charge my Deposit Account No. 04-1644 in the amount of \$_____.
19. ☒ The Commissioner is authorized to charge payment of the following amounts associated with this communication or credit any overpayment to Deposit Account No. 04-1644:
- ☒ Additional filing fees under 37 CFR 1.16 or deficiencies in remittances therefor.
 - ☒ Additional processing fees under 37 CFR 1.17 or deficiencies in remittances therefor.
 - ☐ **ONLY if applicant has partially paid** the patent issue fee under 37 C.F.R. §1.18, then the **deficiency** shall be charged to Deposit Account No. 04-1644, and the Commissioner is authorized to so charge the Deposit Account.

Date: January 20, 2000

Attorney's Signature


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CERTIFICATE OF MAILING BY EXPRESS MAIL

I hereby certify that this Utility Patent Application Transmittal, enclosed application, and any other documents referred to as enclosed herein, are being deposited in an envelope with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated below and addressed to Box PATENT APPLICATION, Assistant Commissioner for Patents, Washington, D.C. 20231.

Express Mail Label No.: EL515100162US

Date of Deposit: January 20, 2000

Typed/Printed Name of Person Signing: Clarence Townsend

Signature:



ALTERED FLOWER PATTERN AND COLOR IN NEW GUINEA IMPATIENS

Related Application Information

This application is a continuation-in-part of U.S. Application No. 60/116,549 filed on January 21, 1999.

Field of the Invention

The present invention relates to new, distinct and stable New Guinea impatiens plants (hereinafter referred to as "NGI") exhibiting a striped pattern or an altered flower color. The NGI plants of the present invention produce an inflorescence containing one or more flowers which have at least one petal per flower which exhibits a striped pattern or an altered flower color. The present invention also relates to methods for making a New Guinea impatiens plants having an inflorescence containing one or more flowers which have at least one petal per flower which exhibits a striped pattern or an altered flower color.

Background of the Invention

Only a very few floricultural crops have been introduced to the floriculture industry in the last 25 years that can compare with the success of New Guinea impatiens. (*New Guinea Impatiens, A Ball Guide*, edited by W. Banner and M. Klopmeier, Ball Publishing (1995)). Initially, the NGI was regarded primarily as a bedding plant. *Id.* Now the crop is no longer confined to a bedding plant classification. *Id.* Instead, growers have realized that NGIs can be used as flowering potted plants and in hanging baskets. *Id.*

Impatiens plants reported to be native to New Guinea were classified in 1886 as *Impatiens Hawkeri*. *Id.* Occasionally, these early specimens were referred to as *Impatiens herzogii*. *Id.* In the early 1900's, botanists from Germany, England and the Netherlands explored parts of the Sunda Islands, and by 1915 nine New Guinea impatiens species were identified from this area: *I. dahlii*, *I. herzogii*, *I. laxterbachii*, *I. linearifolia*, *I. mooreana*, *I. polyphylla*, *I. rodatzii*, *I. schlechteri*,

and *I. trichura*. *Id.* Taxonomically the collections were confusing and were considered to be habitat variations of *I. herzogii* rather than new species by Von R. Schlechter. *Id.* Expeditions by botanists from the United States, Australia, France and Switzerland also searched Papua and the New Guineas for new *impatiens* species. *Id.* In the most recent taxonomic classification, Grey-
5 Wilson proposed that New Guinea *impatiens* belong to one highly variable species, *I. Hawkeri*, in which 15 groups were identified based on geographic location. *Id.*

Although diverse phenotypically, members of New Guinea *impatiens* are interfertile and generally have a 2n chromosome number of 32 (T. Arisumi, *J. Hered.*, 64: 77-79 (1973)). In
10 1970, the U.S. Department of Agriculture introduced 23 *impatiens* from New Guinea, in order to increase the germplasm pool for this crop. (H.F. Winters, *Am. Hortic.*, 52, 923 (1973)). Breeding programs initiated with this material have led to the development of New Guinea *impatiens* plants that are adapted to a variety of light conditions, and have large flowers of a wide variety of colors including white, pink, red, orange, purple, rose, salmon and coral as well as bicolors. (*New*
15 *Guinea Impatiens, A Ball Guide*, edited by W. Banner and M. Klopmeier, Ball Publishing (1995)).

Summary of the Invention

The present invention relates to a NGI plant which has a flower containing at least one
20 petal which exhibits a striped pattern or an altered flower color. This NGI plant may have a pedigree which includes the plants 1865, 2581 or 2582. Additionally, the present invention also includes pollen, ovules and seed from such a striped or altered flower color NGI plant. Moreover, the present invention also relates to a tissue culture of regenerable cells as well as a cutting from such a striped or altered flower color NGI plant.

25 The present invention also relates to a method for producing a NGI plant having a flower with at least one petal which exhibits a striped pattern. The method involves irradiating a NGI plant with electromagnetic radiation, ion beams or treating a NGI plant with a chemical mutagen and then selecting a shoot from the treated plant containing a flower having at least one petal

which exhibits a striped pattern. The irradiated or chemically treated plant may be a rooted cutting or a whole plant.

If irradiated, the plant may be irradiated with gamma rays, x-rays or ultraviolet rays. The NGI plant may be irradiated with from about 1.5 to about 3.5 krad of electromagnetic radiation or ion beams.

If the NGI plant is treated with a chemical mutagen, it may be treated with alkylating sulphonates and sulphates, such as ethyl methane sulphonate, methyl methane sulphonate and diethyl sulphate, or nitroso compounds, such as nitrosoguanidine, ethylnitrosourea and methylnitrosourea.

Finally, the present invention relates to a method for altering the color of the petals of a flower of a NGI plant. The method involves irradiating a NGI plant with electromagnetic radiation, ion beams or treating a NGI plant with a chemical mutagen and then selecting a shoot from the treated plant containing a flower having at least one petal which exhibits an altered flower color. The irradiated or chemically treated plant may be a rooted cutting or a whole plant.

If irradiated, the plant may be irradiated with gamma rays, x-rays or ultraviolet rays. The NGI plant may be irradiated with from about 1.5 to about 3.5 krad of electromagnetic radiation or ion beams.

If the NGI plant is treated with a chemical mutagen, it may be treated with alkylating sulphonates and sulphates, such as ethyl methane sulphonate, methyl methane sulphonate and diethyl sulphate, or nitroso compounds, such as nitrosoguanidine, ethylnitrosourea and methylnitrosourea.

Brief Description of the Figures

The file of this patent contains at least one drawing executed in color. Copies of this

patent with color drawing(s) will be provided by the Patent and Trademark Office upon request and payment of the necessary fee.

Figure 1 shows a photograph of a flower from a NGI plant named 'Grape Crush'. 'Grape Crush' has large round vibrant purple flowers with a red eye. The petals are brighter than Red-Purple Group 74A with the lower four petals commonly displaying bases ("displaying bases" as used herein refers to the area of common connection between the lower four petals) of Red Group 53C (adaxial), and Red-Purple Group 74B (abaxial).

Figure 2 shows a photograph of a flower from NGI plant 1865 of the present invention. The plants of the present invention contain petals which exhibit a striped pattern. The petals have a color of Red-Purple Group 74A (adaxial) and Red-Purple Group 74B (abaxial). The stripes have a color of Red-Purple Group 65C.

Figure 3 shows a photograph of flowers from a NGI plant named 'Lavender Glow'. 'Lavender Glow' has large round purple flowers having a petal color of Purple-Violet Group 81C (adaxial) and Purple-Violet Group 81D (abaxial).

Figure 4 shows a photograph of flowers from NGI plant 2581 of the present invention. The flowers of the plants of the present invention contain petals which exhibit a striped pattern. The petals have a color of Purple-Violet Group 81C (adaxial) and Purple-Violet Group 81D (abaxial). The stripes have a color of Purple Group 75D.

Figure 5 shows a photograph of flowers from NGI plant 2582 of the present invention. The flowers of the plant of the present invention have altered flower color and have petals of color Purple Group 75D with Red-Purple Group 64C at the base (adaxial). Purple Group 75D with Red-Purple Group 64C at the base with midveins of Red-Purple Group 64B (abaxial).

Detailed Description of the Invention

The color chart used in the identification of colors described herein is the R.H.S. Colour Chart of The Royal Horticultural Society, London, England.

5 The NGI plants of the present invention have an inflorescence containing one or more flowers which have at least one petal per flower which exhibits a striped pattern or altered flower color. As used herein, the term “striped pattern” or “striping pattern” means that a darker background color on a flower petal is randomly interdispersed with irregular bands or streaks of a lighter color. As used herein, the term “altered flower color” means that the color on a flower
10 petal has been changed (either lightened or darkened), when compared to a control plant not treated pursuant to the methods hereinafter described.

Figure 1 is a photograph of a flower from a NGI plant named ‘Grape Crush’ (U.S. Plant Patent No. 10,107). ‘Grape Crush’ has large round vibrant purple flowers with a red eye which displays an iridescent appearance. The petals are brighter than Red-Purple Group 74A with the lower four petals commonly displaying bases of Red Group 53C (adaxial), and Red-Purple Group 74B (abaxial). In addition, the foliage is medium green in coloration. Additionally, ‘Grape Crush’ exhibits good basal branching and an attractive moderately compact upright mounded growth habit.

In contrast, Figure 2 is a photograph of a flower from the NGI 1865 of the present invention. Figure 2 shows the distinct striping of the petals of the NGI plants of the present invention. The petals have a color of Red-Purple Group 74A (adaxial) and Red-Purple Group 74B (abaxial). The stripes have a color of Red-Purple Group 65C.

Figure 3 shows a photograph of flowers from a NGI plant named ‘Lavender Glow’. Lavender Glow has large round purple flowers having a petal color of Purple-Violet Group 81C (adaxial) and 81D (abaxial).

Figure 4 shows a photograph of flowers from NGI plant 2581 of the present invention. The flowers of the plant of the present invention contain petals which exhibit a striped pattern. The petals have a color of Purple-Violet Group 81C (adaxial) and Purple-Violet Group 81D (abaxial). The stripes have a color of Purple Group 75D.

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Figure 5 shows a photograph of flowers from NGI plant 2582 of the present invention. The flowers of the plant of the present invention have petals of color Purple Group 75D with Red-Purple Group 64C at the base (adaxial). Purple Group 75D with Red-Purple Group 64C at the base with midveins of Red-Purple Group 64B (abaxial).

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This previously unknown striped and altered flower color NGI plants of the present invention arose as a result of the irradiation of a NGI plant with electromagnetic radiation, particularly, gamma rays. It is believed that the irradiation of a NGI causes a somatic mutation in the cells which produce flower color and thus results in a chimera having flowers with striped petals or flowers having altered color. Additionally, the striped NGI plants of the present invention maintain functional male and female organs.

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It is believed that the striped pattern and altered flower color in the petals of a NGI plant can also be obtained in a NGI plant by irradiating a plant with other types of electromagnetic radiation such as x-rays, ultraviolet rays as well as with ion beams. The NGI plant can be irradiated with from about 1.5 to about 3.5 kilorads of electromagnetic radiation or ion beams. Preferably, the NGI plants are irradiated with from about 2.0 to 3.0 kilorads of radiation or ion beams.

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Additionally, the striped and altered flower color NGI plants of the present invention may also be produced by treating a NGI plants with a chemical mutagen. Like the irradiation described earlier, it is believed that treating a NGI with a chemical mutagen causes a somatic mutation in the cells which produce flower color and thus results in a chimera having flowers with

striped petals or altered flower color. Any chemical mutagen which causes a somatic mutation can be used to produce the striped or altered flower color NGI plants of the present invention. If the NGI plant is treated with a chemical mutagen, it may be treated with alkylating sulphonates and sulphates, such as ethyl methane sulphonate, methyl methane sulphonate and diethyl sulphate, or nitroso compounds, such as nitrosoguanidine, ethylnitrosourea and methylnitrosourea.

Protocols for treating seeds with mutagens such as ethyl methane sulphonate (hereinafter "EMS") are well established in the art. A standard procedure using *Arabidopsis* seed includes treatment with 0.1% to 0.3% EMS for about eight to about twelve hours. Treatment methods may include immersion of shoots, buds, seeds or cell cultures in the chemical solution. Immersion under pressure or the use of penetrating agents, such as dimethyl sulphoxide, may improve the penetration of the chemical into the plant tissue. In addition, solutions may be injected into buds or administered through cut ends of shoots.

A cutting rooted in a suitable growth medium, such as oasis, or an entire NGI plant may be irradiated or treated with a chemical mutagen using the processes described herein. If a rooted cutting is used, once irradiated or treated with a chemical mutagen, the cutting is allowed to grow. Shoots from the treated plants containing flowers having petals exhibiting the striped pattern or altered flower color described herein are then selected and propagated through cuttings or other forms of asexual reproduction. Further selections may be made if desired and maintained through successive generations via asexual reproduction. If an entire NGI plant is irradiated or treated with a chemical mutagen, shoots from the treated plant containing flowers having petals exhibiting the striped pattern or altered flower color are selected and propagated through asexual reproduction.

Using the techniques described herein, the striped pattern or altered petal color may be incorporated into NGI plants having many different flower colors, including plants with bicolor flowers. Additionally, the striped pattern or altered flower color can be incorporated into NGI plants having solid green foliage, green and yellow variegated foliage, dark green foliage, dark purplish leaves, dark purplish and cream variegated foliage, etc.

The NGI plants of the present invention are genetically stable and can be stably reproduced by means of asexual propagation. It is expected that any striped or altered flower color NGI plant can be produced commercially through asexual propagation. Cuttings for asexual propagation can be taken at any time of the year and no special hormones or soil mixtures are required.

By way of example, and not of limitation, examples of the present invention shall now be given.

Example 1: Irradiation Program to develop NGI Plant 1865

‘Grape Crush’ (U.S. Plant Patent 10,107) is a compact, New Guinea impatiens plant having medium green foliage and vibrant solid red-purple flowers. The petals are brighter than Red-Purple Group 74A with the lower four petals commonly displaying bases of Red Group 53C (adaxial), and Red-Purple Group 74B (abaxial). As shown in Figure 1, the petals of ‘Grape Crush’ do not exhibit a striped pattern. ‘Grape Crush’ is commercially available from Ball FloraPlant, 622 Town Road, West Chicago, Illinois 60185-2698.

Cuttings from ‘Grape Crush’ were irradiated with 2 kilorads of gamma rays. The irradiated cuttings were allowed to grow. A cutting containing a flower having petals which exhibited a striped pattern was made and allowed to grow. The resulting plant contained a number of flowers having petals which exhibited the striped pattern. A cutting of these flowers containing the petals with the striped pattern was made and planted. This cutting was designated 1865. As shown in Figure 2, the petals of 1865 have a color of Red-Purple Group 74A (adaxial) and 74B (abaxial). The stripes have a color of Red-Purple Group 65C.

Example 2: Detailed Description of Striped NGI Plant 1865 and Comparison with ‘Grape Crush’

The color chart used in the identification of colors described herein is the R.H.S. Colour Chart of The Royal Horticultural Society, London, England.

Characteristic	NGI Plant 1865	'Grape Crush'
Propagation		
Type cutting	Terminal tip	Terminal tip
Time to initiate roots	Approximately 14-21 days	Approximately 14-21 days
Rooting habit	Fibrous, branching	Fibrous, branching
Plant Description		
General appearance and form	Medium, upright mounded	Moderately compact, upright mounded
Crop time	Finished plant 10 weeks after planting a rooted cutting	Finished plant 8 to 10 weeks after planting a rooted cutting
Branching habit	Freely basal branching without pinching or growth regulators	Freely basal branching without pinching or growth regulators
Lateral branch number	Approximately 4	Approximately 5
Lateral branch length	Approximately 11.8 cm	Approximately 11.5 cm
Lateral branch diameter	Approximately 8 mm	Approximately 8 mm
Internode length	Approximately 4.6 cm	Approximately 2.5 to 2.8 cm
Stem color	Greener than Yellow-Green Group 144A with Greyed Purple Group 183B at nodes	Greener than Yellow-Green Group 144A with Greyed - Purple Group 183D at nodes.
Height of foliage	Approximately 16 cm above a 10 cm pot	Approximately 8 to 9 cm above a 10 cm pot
Area of spread	Approximately 27 cm	Approximately 20 to 23

Foliage Description		
Form	Elliptic with acuminate apex and attenuate base	Elliptic with acuminate apex and an acuminate base
Margin	Serrate, ciliate	Serrate
Arrangement	Alternate or in whorles of 5 or 6	Alternate or in whorles of 5 or 6
Venation pattern	Arcuate	Arcuate
Surface	Upper is rough; lower smooth	Upper is rough; lower smooth
Color of mature foliage-upper surface	Between Green Group 137 A and Green Group 143A with veins of Yellow-Green Group 148A and midrib of Greyed-Orange Group 76C	Green Group 139A with veins and midrib of Yellow-Green Group 146D
Color of mature foliage-lower surface	Between Yellow-Green Group 146B and Yellow-Green Group 147B with veins and midrib of Yellow-Green Group 148A	Green Group 138A with midrib and veins of Yellow-Green Group 146D
Size	Approximately 9.2 cm in length and approximately 3.1 cm in width	Approximately 9 to 10 cm in length and 3 to 3.7 cm in width
Petiole length	Approximately 1.8 cm	Approximately 2 cm
Petiole diameter	Approximately 2 mm	Approximately 2mm
Petiole color	Lighter than Grey-Orange Group 176C	Lighter than Grey-Orange Group 176C
Flower Description		
Flowering habit	Freely flowering under outdoor conditions with substantially continuous blooming from spring and fall	Freely flowering under outdoor conditions with substantially continuous blooming from spring until fall

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Flowers borne	Above foliage, arising from leaf axils	Above foliage, arising from leaf axils
Peduncle length	Approximately 6.1 cm	Approximately 6 cm
Peduncle color	Yellow-Green Group 146C overlaid with Greyed-Purple Group 183D	Yellow-Green Group 146C with very faint overlay of Greyed-Purple Group 183D
Flower form	Single	Single
Quantity of flowers	Approximately 3 per lateral branch	Approximately 6 to 7 per lateral branch
Flower size	Approximately 5.9 cm	Approximately 5.3 to 6 cm
Number of petals	5, overlapping	5, overlapping
Petal texture	Iridescent	Iridescent
Petal shape	Obovate	Somewhat heart-shaped
Petal margin	Entire	Entire
Petal apex	Emarginate	Emarginate
Petal base	Lower petals narrow; upper petal has a broad base	Lower petals narrow; upper petal has a broad base
Petal length	3.3 cm	3 cm
Petal width	3.5 cm	3.7 cm
Flower color-fully opened	Petals are Red-Purple Group 74A with stripes of Red-Purple Group 65C (adaxial); Red-Purple Group 74B (abaxial)	Petals are brighter than Red-Purple Group 74A with the lower four petals commonly displaying bases Red Group 53A (adaxial); and Red-Purple Group 74B (abaxial)
Flower bud shape	Ellipsoidal	Ellipsoidal
Flower bud length	Approximately 2.1 cm	Approximately 2 cm

Flower bud diameter	Approximately 1.1 cm	Approximately 1.7 cm
Sepals	Three sepals plus two rudimentary sepals are fused into the under surface of the superior petal. A spur originating from the base of the inferior sepal is approximately 5.7 cm in length on fully opened flowers. The spur color is Red-Purple Group 60A with Yellow-Green Group 145A at tip.	Three sepals plus two rudimentary sepals are fused into the under surface of the superior petal. A spur originating from the base of the inferior sepal is approximately 5 to 6 cm in length on fully opened flowers. The spur color is Red-Purple Group 60A
Reproductive organs	The anthers are fused together forming one organ that surrounds the pistil. The pistil is approximately 5 mm long, the stigma color is Yellow-Green Group 144A. Generally, the anthers shed pollen prior to the stigma becoming receptive. The pollen color is Yellow Group 11B.	The anthers are fused together forming one organ that surrounds the pistil. The stamens are Red-Purple Group 74B. The ovary color is Yellow-Green Group 144A. Generally, the anthers shed pollen prior to the stigma becoming receptive. The pollen color is Yellow Group 11B.

Example 3: Irradiation Program to develop NGI Plant 2581

‘Lavender Glow’ is an upright, mounded New Guinea impatiens plant having medium green foliage and solid purple flowers. The petals have a color of Purple-Violet Group 81C (adaxial) and 81D (abaxial). As shown in Figure 3, the petals of ‘Lavender Glow’ do not exhibit a striped pattern. ‘Lavender Glow’ is commercially available from Ball FloraPlant, 622 Town Road, West Chicago, Illinois 60185-2698.

Cuttings from ‘Lavender Glow’ were irradiated with 2 kilorads of gamma rays. The

irradiated cuttings were allowed to grow. A cutting containing a flower having petals which exhibited a striped pattern was made and allowed to grow. This cutting was designated 2581. As show in Figure 4, the petals of 2581 have a color of Purple-Violet Group 81C (adaxial) and Purple-Violet Group 81D (abaxial). The stripes have a color of Purple Group 75D.

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Example 4: Detailed Description of Striped NGI Plant 2581 and Comparison with ‘Lavender Glow’

Characteristic	NGI Plant 2581	‘Lavender Glow’
Propagation		
Type cutting	Terminal tip	Terminal tip
Time to initiate roots	Approximately 14-21 days	Approximately 14-21 days
Rooting habit	Fibrous, freely branching	Fibrous, fine, freely branching
Plant Description		
General appearance and form	Upright and mounded; medium size; vigorous	Upright and mounded; medium size; vigorous
Crop time	Finished plant 8-10 weeks after planting a rooted cutting	Finished plant approximately 10 weeks after planting a rooted cutting
Branching habit	Freely basal branching without pinching or growth regulators	Freely basal branching without pinching or growth regulators
Lateral branch numbers	Approximately 5	Approximately 5 to 7
Lateral branch length	Approximately 15.8 cm	Approximately 11 to 12 cm
Lateral branch diameter	Approximately 8.3 mm	Approximately 5 to 7 mm
Internode length	Approximately 4.5 cm	Approximately 3 to 4 cm
Stem color	Greyed-Purple Group 183A	Greyed-Purple Group 183D
Height of foliage	Approximately 18 cm above a 10 cm pot	Approximately 14 to 16 cm above a 10 cm pot
Area of spread	Approximately 35 cm	Approximately 20 to 25 cm

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Foliage Description		
Form	Elliptic with acute apex and acuminate base	Elliptic with acuminate apex and attenuate base
Margin	Serrate, ciliate	Serrate, ciliate
Arrangement	Opposite	Whorles or opposite
Venation pattern	Arcuate	Arcuate
Surface	Smooth	Slightly rugose; glossy; glabrous
Color of mature foliage-upper surface	Closest to Green Group 137C with veins of Greyed-Purple Group 185B	Green Group 139A with veins of Red-Purple Group 59C
Color of mature foliage-lower surface	Closest to Green Group 137C with veins of Greyed-Purple Group 185A	Green Group 138B with veins of Red-Purple Group 59B
Size	Approximately 9.4 cm in length and approximately 3.5 cm in width	Approximately 7 to 8 cm in length and approximately 2 to 3 cm in width
Petiole length	Approximately 1.7 cm	Approximately 5 to 10 mm
Petiole diameter	Approximately 3 mm	Approximately 1.5 to 2.5 mm
Petiole color	Upper surface is Greyed-Purple Group 185B; lower surface is Greyed-Purple Group 185A	Greyed-Purple Group 183D
Flower Description		
Flowering habit	Freely flowering under outdoor conditions with substantially continuous blooming from spring until fall	Freely flowering under outdoor conditions with substantially continuous blooming from spring until fall

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Flower type	Generally flat and rounded; typically face outward to upward	Generally flat and rounded; typically face outward to upward
Flowers borne	Above foliage, arising from leaf axils	Above foliage, arising from leaf axils
Peduncle length	Approximately 5.5 cm	Approximately 4 to 6 cm
Peduncle color	Grey-Purple Group 182B	Greyed-Purple Group 183D
Flower form	Single; sometimes exhibits “siamese” flowers	Single
Quantity of flowers per lateral stem	Approximately 3	Approximately 2
Quantity of flowers buds per lateral stem	Approximately 5	Approximately 5
Quantity of flowers per plant	Approximately 15	Approximately 10
Flower size	Approximately 6.2 cm width; approximately 2 cm depth	Approximately 7.3 to 7.5 cm width; approximately 1 cm depth
Number of petals	5, overlapping	5, overlapping
Petal texture	Smooth, iridescent	Smooth, iridescent
Petal shape	Obovate	Cordate
Petal margin	Somewhat lacerate	Entire
Petal apex	Emarginate	Retuse
Petal base	Acuminate	Attenuate
Petal length	Approximately 3.4 cm	Approximately 3 to 4 cm
Petal width	Approximately 4.2 cm	Approximately 5 to 6 cm

Flower color- fully opened	Petals are Purple-Violet Group 81C with stripes of Purple Group 75D (adaxial); Purple-Violet Group 81D (abaxial)	Petals are Purple-Violet Group 81C fading to Purple Group 76A (adaxial); Purple-Violet Group 81D (abaxial)
Flower bud shape	Oval-pointed	Elliptic
Flower bud length	Approximately 2.4 cm	Approximately 1.6 to 1.8 cm
Flower bud diameter	Approximately 1.3 cm	Approximately 1 cm
Flower bud color	Purple-Violet Group 81b	Purple-Violet Group 80A
Sepals	Three sepals plus two rudimentary sepals are fused into the under surface of the superior petal. A spur originating from the base of the inferior sepal is approximately 5.3 cm in length on fully opened flowers. The spur color is Red-Purple Group 60A.	Three sepals plus two rudimentary sepals are fused into the under surface of the superior petal. A spur originating from the base of the inferior sepal is approximately 5 to 6 cm in length on fully opened flowers. The spur color is Greyed-Purple 183D

Reproductive organs	The anthers are fused together forming one organ that surrounds the pistil. The pistil is approximately 5 mm long, the stigma color is Yellow-Green Group 150D, the style color is Green Group 143C, and the ovary color is Green Group 143A. Anthers are 3 mm in length having a color of Yellow Group 12D. Generally, the anthers shed pollen prior to the stigma becoming receptive. Pollen is produced in moderate amounts and has color Yellow Group 11C.	The anthers are fused together forming one organ that surrounds the pistil. The ovary color is Yellow-Green Group 144A. Anthers are obovate. Generally, the anthers shed pollen prior to the stigma becoming receptive. Pollen color is Yellow Group 11B.
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Example 5: Irradiation Program to Develop NGI Plant 2582

‘Lavender Glow’ is an upright, mounded New Guinea impatiens plant having medium green foliage and solid red-purple flowers. The petals have a color of Purple-Violet Group 81C (adaxial) and Purple-Violet Group 81D (abaxial). As shown in Figure 3, the petals of ‘Lavender Glow’ do not exhibit a striped pattern. Lavender glow is commercially available from Ball FloraPlant, 622 Town Road, West Chicago, Illinois 60185-2698.

10 Cuttings from ‘Lavender Glow’ were irradiated with 2 kilorads of gamma rays. The irradiated cuttings were allowed to grow. A cutting containing a flower having petals which exhibited an altered flower color was made and allowed to grow. This cutting was designated 2582. As shown in Figure 5, the petals of 2582 have a color of Purple Group 75D with Red-Purple Group 64C at the base (adaxial). Purple Group 75D with Red-Purple Group 64C at the

base with midveins of Red-Purple Group 64B (abaxial).

Example 6: Detailed Description of Altered Flower Color NGI Plant 2582 and Comparison with ‘Lavender Glow’

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Characteristic	NGI Plant 2582	‘Lavender Glow’
Propagation		
Type cutting	Terminal tip	Terminal tip
Time to initiate roots	Approximately 14-21 days	Approximately 14-21 days
Rooting habit	Fibrous, freely branching	Fibrous, fine, freely branching
Plant Description		
General appearance and form	Upright and mounded; medium size; vigorous	Upright and mounded; medium size; vigorous
Crop time	Finished plant 8-10 weeks after planting a rooted cutting	Finished plant approximately 10 weeks after planting a rooted cutting
Branching habit	Freely basal branching without pinching or growth regulators	Freely basal branching without pinching or growth regulators
Lateral branch number	Approximately 4	Approximately 5 to 7
Lateral branch length	Approximately 15.3 cm	Approximately 11 to 12 cm
Lateral branch diameter	Approximately 8.3 mm	Approximately 5 to 7 mm
Internode length	Approximately 5 cm	Approximately 3 to 4 cm
Stem color	Greyed-Purple Group 183A	Greyed-Purple Group 183D
Height of foliage	Approximately 21 cm above a 10 cm pot	Approximately 14 to 16 cm above a 10 cm pot
Area of spread	Approximately 31 cm	Approximately 20 to 25 cm

Foliage Description		
Form	Elliptic with acute apex and acuminate base	Elliptic with acuminate apex and attenuate base
Margin	Serrate, ciliate	Serrate, ciliate
Arrangement	Opposite	Whorles or opposite
Venation pattern	Arcuate	Arcuate
Surface	Smooth	Slightly rugose; glossy; glabrous
Color of mature foliage-upper surface	Closest to Green Group 139A with veins of Greyed-Purple Group 185C	Green Group 139A with veins of Red-Purple Group 59C
Color of mature foliage-lower surface	Closest to Green Group 137C with veins of Greyed-Purple Group 185A	Green Group 138B with veins of Red-Purple Group 59B
Size	Approximately 7.5 cm in length and approximately 3.3 cm in width	Approximately 7 to 8 cm in length and approximately 2 to 3 cm in width
Petiole length	Approximately 1.4 cm	Approximately 5 to 10 mm
Petiole diameter	Approximately 2 mm	Approximately 1.5 to 2.5 mm
Petiole color	Upper surface is Greyed-Purple Group 185B; lower surface is Greyed-Purple Group 185A	Greyed-Purple Group 183D

Flower Description		
Flowering habit	Freely flowering under outdoor conditions with substantially continuous blooming from spring until fall	Freely flowering under outdoor conditions with substantially continuous blooming from spring until fall
Flower type	Generally flat and rounded; typically face outward to upward	Generally flat and rounded; typically face outward to upward
Flower borne	Above foliage, arising from leaf axils	Above foliage, arising from leaf axils
Peduncle length	Approximately 5.1 cm	Approximately 4 to 6 cm
Peduncle color	Greyed-Red Group 182B	Greyed-Purple Group 183D
Flower form	Single	Single
Quantity of flowers per lateral stem	Approximately 2	Approximately 2
Quantity of flowers buds per lateral stem	Approximately 4	Approximately 5
Quantity of flowers per plant	Approximately 8	Approximately 10
Flower size	Approximately 6.5 cm width; approximately 2 cm depth	Approximately 7.3 to 7.5 width; approximately 1 cm depth
Number of petals	5, overlapping	5, overlapping
Petal texture	Smooth, iridescent	Smooth, iridescent
Petal shape	Obovate	Cordate
Petal margin	Entire	Entire
Petal apex	Emarginate	Retuse

Petal base	Acuminate	Attenuate
Petal length	Approximately 3.1 cm	Approximately 3 to 4 cm
Petal width	Approximately 4.1 cm	Approximately 5 to 6 cm
Flower color-fully opened	Petals are Purple Group 75D with Red-Purple Group 64C at the base (adaxial); Purple Group 75D with Red-Purple Group 64C at the base with midveins of Red-Purple Group 64B (abaxial)	Petals are Purple-Violet Group 81C fading to Purple Group 76A (adaxial); Purple-Violet Group 81D (abaxial)
Flower bud shape	Oval-pointed	Elliptic
Flower bud length	Approximately 1.7 cm	Approximately 1.6 to 1.8 cm
Flower bud diameter	Approximately 1 cm	Approximately 1 cm
Flower bud color		Purple-Violet Group 80A
Sepals	Three sepals plus two rudimentary sepals are fused into the under surface of the superior petal. A spur originating from the base of the inferior sepal is approximately 5 cm in length on fully opened flowers. The spur color is Red-Purple Group 60A.	Three sepals plus two rudimentary sepals are fused into the under surface of the superior petal. A spur originating from the base of the inferior sepal is approximately 5 to 6 cm in length on fully opened flowers. The spur color is Greyed-Purple Group 183D.

Reproductive organs	<p>The anthers are fused together forming one organ that surrounds the pistil. The pistil is approximately 5 mm long, the stigma color is Yellow-Green Group 144D, the style color is Yellow-Green Group 144C, and the ovary color is Yellow-Green Group 144B. Anthers are 3 mm in length having a color of Yellow Group 12D.</p> <p>Generally, the anthers shed pollen prior to the stigma becoming receptive. Pollen is produced in moderate amounts and has color Yellow Group 12D.</p>	<p>The anthers are fused together forming one organ that surrounds the pistil. The ovary color is Yellow-Green Group 144A. Anthers are obovate. Generally, the anthers shed pollen prior to the stigma becoming receptive. Pollen color is Yellow Group 11B.</p>
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The present invention is illustrated by way of the foregoing description and examples. The foregoing description is intended as a non-limiting illustration, since many variations will become apparent to those skilled in the art in view thereof. It is intended that all such variations within the scope and spirit of the appended claims be embraced thereby.

Changes can be made to the composition, operation and arrangement of the method of the present invention described herein without departing from the concept and scope of the invention as defined in the following claims.

WHAT IS CLAIMED IS:

1. A New Guinea impatiens plant comprising a flower having at least one petal which exhibits a striped pattern.

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2. The New Guinea impatiens plant of claim 1, wherein the plant has a pedigree which includes the plant 1865 or 2581.

3. Pollen of the plant of claim 1.

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4. An ovule of the plant of claim 1.

5. A tissue culture comprising regenerable cells of the plant of claim 1.

6. A cutting of the plant of claim 1.

7. A method for producing a New Guinea impatiens plant having a flower with at least one petal which exhibits a striped pattern, the method comprising the steps of: irradiating a New Guinea impatiens plant with electromagnetic radiation or ion beams and selecting a shoot from said plant containing a flower having at least one petal which exhibits a striped pattern.

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8. The method of claim 7 wherein the New Guinea impatiens plant is a cutting or a whole plant.

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9. The method of claim 7 wherein the New Guinea impatiens plant is irradiated with gamma rays, x-rays or ultraviolet rays.

10. The method of claim 7 wherein the New Guinea impatiens plant is irradiated with from about 1.5 to about 3.5 krad of electromagnetic radiation or ion beams.

11. A New Guinea impatiens plant comprising a flower having at least one petal which exhibits a striped pattern produced by the method of claim 7.

5 12. Pollen of the plant of claim 11.

13. An ovule of the plant of claim 11.

14. A tissue culture comprising regenerable cells of the plant of claim 11.

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15. A cutting of the plant of claim 11.

16. A method for producing a New Guinea impatiens plant having a flower with at least one petal which exhibits a striped pattern, the method comprising the steps of: treating a New Guinea impatiens plant with a chemical mutagen and selecting a shoot from said plant containing a flower having at least one petal which exhibits a striped pattern.

17. The method of claim 16 wherein the New Guinea impatiens plant is a cutting or a whole plant.

18. The method of claim 16 wherein the chemical mutagen is ethyl methane sulphonate, methyl methane sulphonate, diethyl sulphate, nitrosoguanidine, ethylnitrosoarea or methylnitrosoarea.

19. A New Guinea impatiens plant comprising a flower having at least one petal which exhibits a striped pattern produced by the method of claim 16.

20. Pollen of the plant of claim 19.

21. An ovule of the plant of claim 19.

22. A tissue culture comprising regenerable cells of the plant of claim 19.

5 23. A cutting of the plant of claim 19.

24. A method for altering the color of the petals of a flower of a New Guinea
impatiens plant, the method comprising the steps of: treating a New Guinea impatiens plant with
electromagnetic radiation or ion beams and selecting a shoot from said plant containing a flower
10 having at least one petal exhibiting an altered color.

25. The method of claim 24 wherein the New Guinea impatiens plant is a cutting or a
whole plant.

15 26. The method of claim 24 wherein the New Guinea impatiens plant is irradiated with
gamma rays, x-rays or ultraviolet rays.

20 27. The method of claim 24 wherein the New Guinea impatiens plant is irradiated with
from about 1.5 to about 3.5 krad of electromagnetic radiation or ion beams.

28. A New Guinea impatiens plant comprising a flower having at least one petal which
exhibits an altered color produced by the method of claim 24.

25 29. The New Guinea impatiens plant of claim 28, wherein the plant has a pedigree
which includes the plant 2582.

30. Pollen of the plant of claim 28.

31. An ovule of the plant of claim 28.

32. A tissue culture comprising regenerable cells of the plant of claim 28.

33. A cutting of the plant of claim 28.

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34. A method for altering the color of the petals of a flower of a New Guinea impatiens plant, the method comprising the steps of: treating a New Guinea impatiens plant with a chemical mutagen and selecting a shoot from said plant containing a flower having at least one petal exhibiting an altered color.

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35. The method of claim 34 wherein the chemical mutagen is ethyl methane sulphonate, methyl methane sulphonate, diethyl sulphate, nitrosoguanidine, ethylnitrosourea or methylnitrosourea.

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36. A New Guinea impatiens plant comprising a flower having at least one petal which exhibits an altered color produced by the method of claim 34.

37. Pollen of the plant of claim 36.

38. An ovule of the plant of claim 36.

39. A tissue culture comprising regenerable cells of the plant of claim 36.

40. A cutting of the plant of claim 36.

Abstract of the Invention

The present invention relates to NGI plants which produce an inflorescence containing one or more flowers which have at least one petal per flower which exhibits a striped pattern or altered flower color and methods for making such plants.

FIGURE 1

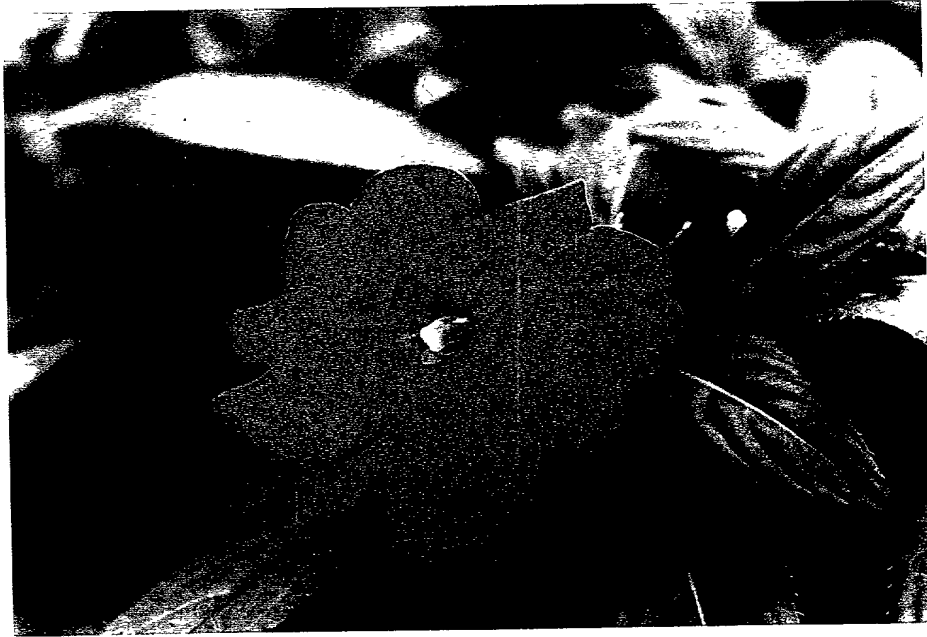


FIGURE 2

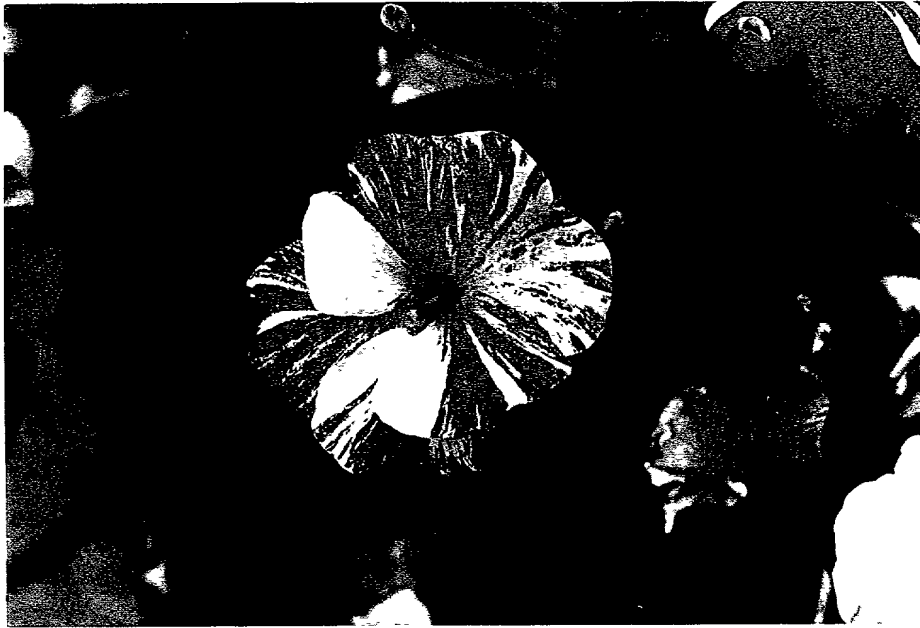


FIGURE 3



FIGURE 4



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FIGURE 5



DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION (37 CFR 1.63)	<input type="checkbox"/> Declaration Submitted With Initial Filing	<input type="checkbox"/> Declaration Submitted After Initial Filing (surcharge (37 CFR 1.16(a)) required
	Attorney Docket No.: BAL6019P0021US	
	First Named Inventor: Scott Trees	
	COMPLETE IF KNOWN	
	Application Number:	
	Filing Date:	
Group Art Unit:		
Examiner Name:		

As a below-named inventor, I hereby declare that:

My residence, post office address, and citizenship are as stated below next to my name.

I believe I am the original, first, and sole inventor (if only one name is listed) or an original, first, and joint inventor (if plural names are listed) of the subject matter which is claimed and for which a patent is sought on the invention entitled: **Altered Flower Pattern and Color In New Guinea Impatiens**, the specification of which:

- ☒ is attached hereto; or
- ☐ was filed on _____
as Application Serial No. _____
and was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose all information to the Patent and Trademark Office known to me to be material to patentability of this application, as defined in 37 CFR. 1.56.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT International application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or of any PCT International application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Numbers	Country	Foreign Filing Date	Priority Not Claimed	Certified Copy Attached?	
				YES	NO
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- ☐ Additional foreign application numbers are listed on a supplemental priority data sheet (PTO/SB/02B) attached hereto.

I hereby claim the benefit under 35 U.S.C. 119 (e) of any United States application(s) listed below.

Application Number(s)	Filing Date	<input type="checkbox"/> Additional provisional application numbers are listed on a supplemental priority data sheet (PTO/SB/02B) attached hereto.
60/116,549	January 21, 1999	

I hereby claim the benefit under 35 U.S.C. 120 of any United States application(s), or 365(c) of any PCT International application designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. 112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application.

U.S. Parent Application or PCT Parent Number	Parent Filing Date	Parent Patent Number (if applicable)

☐ Additional U.S. or PCT International application numbers are listed on a supplemental priority data sheet (PTO/SB/02B) attached hereto.

As a named inventor, I hereby appoint the following registered practitioner(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

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I hereby declare that all statements made herein of my knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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Signature:		Date: